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of Agassiz, as far as they can be detected by his MS. labels, fifty-nine genera and 163 species are recorded, of which 117 have been obtained at Armagh, Ireland. Fourteen of the genera are founded on the spines of Hybodonts, four generic names denote various peculiar cranial bones and dermal plates, the true anatomical relations of which are as yet unknown, and forty-one are founded on the various forms of teeth of the types *Orodus*, *Petalodus*, *Cochliodus*, *Psammodus* and *Copodus*. Mr. Davis states that, judging from analogy, the teeth of *Cladodus* may have been associated with the spines of *Ctenacanthus*. The spines of *Oracanthus* are stated to have probably occupied a lateral position on the head of these elasmobranchs. The worn condition of their apices proves that they were not dorsal, while their solid points, decorated on both sides, show that they were not true dermal plates.

*Tertiary*.—Mr. Newton (*Geol. Mag.*, October) records the occurrence of the cave hyæna, which, with Professor Boyd Dawkins, he regards as a large variety of *H. crocuta*, in the "Forest Bed" strata of Suffolk, England.

*Quaternary*.—The alluvial deposits of the Kashmir district are stated by Mr. R. Lydekker to be of vast and varied extent and composition. The town of Kishtwar, in the Chinab valley, is built on one of these deposits, at a level of several hundred feet above the river. The presence of fine clayey and sandy horizontal layers in the valleys, at considerable elevations above the bottom of the valley, prove that a dam once existed lower down the valley, and Mr. Drew has estimated that the great lake of Kashmir must once have stood 2000 feet above the present level of the valley.

#### MINERALOGY<sup>1</sup>.

AMERICAN GEMS AND PRECIOUS STONES.—Mr. Geo. F. Kunz has contributed to "The Mineral Resources of the United States," published by the Government, an article on American gems and precious stones, of which separate copies have been printed. Mr. Kunz has for some years been connected with Messrs. Tiffany and Co., the well known jewelers of New York city, and has had an excellent opportunity for collecting facts concerning American gems.

He states that systematic mining for gems and precious stones is being carried on at only two places in the United States, viz., Paris, Maine, and Stony Point, North Carolina. In other cases where gems are found they are either met with accidentally, or occur in connection with other materials that are being mined, or in small veins which are only occasionally met with. They are often gathered with little system on the surface, as is the case with

<sup>1</sup> Edited by Professor H. CARVILL LEWIS, Academy of Natural Sciences, Philadelphia, to whom communications, papers for review, etc., should be sent.

the sapphire, garnet and olivine found in Montana and New Mexico; or from the beds of streams and decomposing rock, as the moss agate from Colorado; or on beaches, as the agate, chlorastrolite and thomsonite from Lake Superior.

Some eighty-eight different minerals occur in the United States which have been used as gems. Twelve of these occur in the the United States only.

*Diamonds* are not mined in this country, although they have occasionally been found at a number of localities. A large diamond was found at Manchester, opposite Richmond, Va., by a laborer employed in grading one of the streets. It was an octahedron, and weighed, after it was cut, over ten karats. It was worth \$5000 before cutting. The principal localities for *sapphires* and *rubies* are in New Mexico, Arizona, and Southern Colorado, where they occur in the sand, often on ant-hills. *Garnets* occur in the same region, about \$5000 worth of cut stones being annually produced. It is estimated that the value of the *tourmalines* taken from Mt. Mica, Maine, is between \$50,000 and \$65,000. *Tourmaline* and *hiddenite* are being regularly mined at Stony Point, N. C., some \$7500 worth having already been sold. *Rock crystal* is gathered and cut in large quantities, the sales at different localities probably amounting to \$40,000 annually. Much of it is cut for jewelry, as "Lake George" or "Cape May" "diamonds." The clear crystal for optical purposes is almost entirely Brazilian, as the good material found here rarely reaches the proper channels. Although *agates* are abundant here, nearly all the polished specimens sold in America have been polished in Germany, having originally came from Brazil and Uruguay. *Moss agates*, however, are collected here in large quantities, although the cutting is done abroad. The *sunstone* and *moonstone* from Pennsylvania and Virginia is of good quality, although as yet used but little. The American *turquoise* is of much interest, but is not much used by jewelers. It is frequently blue when found, but soon turns green on exposure. *Jet* occurs in Colorado and Texas, and will probably soon be utilized in the arts. The *Bowenite* of Rhode Island, and the *Williamsite* of Pennsylvania, are used as a substitute for jade.

A large number of minerals have been cut and used as gems or ornaments, and Mr. Kunz's article will be of service in stimulating more systematic search for the precious minerals. It could be wished, perhaps, that the article referred to was more complete as to localities, but this will doubtless be rectified in another year's report.

In stating that sphene does not occur as a gem in the United States, Mr. Kunz has evidently not been aware of the beautiful, transparent yellow crystals, often of large size, which occur in Delaware county, Pennsylvania.

A NEW MINERAL.—Under the name of *richellite* MM. Cesaro and Despret<sup>1</sup> have described a supposed new mineral from Richelle, near Visé, Belgium. It is regarded as a hydrous fluo-phosphate of iron and calcium, and is a compact, soft, earthy substance of pale yellowish color and greasy luster, having a hardness of 2-3 and specific gravity 2. The composition is

PO <sub>5</sub>	Fe <sub>2</sub> O <sub>3</sub>	Al <sub>2</sub> O <sub>3</sub>	CaO	H <sub>2</sub> O
28.67	28.71	1.80	5.64	35.54

Of the water, 23.33 per cent is driven off at 100°. Further examination is needed to show that the mineral is homogeneous and a good species.

GEMS FROM THE HIMALAYA MOUNTAINS.—Professor C. U. Shepard<sup>2</sup> has called attention to the discovery of a remarkable locality for sapphire and ruby in the Himalaya mountains. The crystals occur with other varieties of corundum in a schistose or slaty rock, and are associated with chlorite. The gems, which are limpid and finely colored, are also finely crystallized. The locality was discovered accidentally, but is now guarded by government troops. Professor Shepard believes that the resemblances between the mode of occurrence of these Indian gems and those found in North and South Carolina are “sufficiently important to encourage the expectation that valuable corundum gems may yet be found in the United States.”

Professor Shepard is apparently not aware that a much more full account of this discovery of gems in India was published more than a year ago, by Professor F. R. Mallet, in a paper entitled “On Sapphires recently discovered in the northwest Himalaya.”<sup>3</sup>

It is there stated that the correct locality is Padam, east of the village of Machel, Zanskar district, territory of Kashmir. The gems were exposed by a landslide, and occur far up on the mountain at the limit of perpetual snow. Some of the sapphires discovered were a foot in length. A physical and crystallographic description of the crystals is given. In the center of a hexagonal prism of sapphire, a cavity was found, in which were two crystals of tourmaline. Frequently the specimens are coated with a thin white mineral resembling gibbsite.

The crystals are bluish white and translucent, with transparent fine blue portions irregularly mixed. These blue portions of course constitute the only valuable parts of the crystals, and are carefully cut out by the lapidaries.

DESCLOIZITE FROM MEXICO.—S. L. Penfield<sup>4</sup> has analyzed a vanadium mineral from near Zacatecas, Mexico, which, while having the physical properties of the mineral recently described

<sup>1</sup> Ann. Soc. Belg., Mem. x, 1883.

<sup>2</sup> Amer. Jour. Sc., Nov., 1883.

<sup>3</sup> Records Geolog. Surv. of India, Vol. xv, Part 2, p. 138.

<sup>4</sup> Amer. Jour. Sc., Nov., 1883.

by A. Frenzel under the name of *tritochorite*, appears to be undoubted descloizite. The very small crystals, grouped somewhat like the common crystallizations of calamine or prehnite, had a columnar fibrous structure, distinct columnar cleavage, dark-brown color and resinous luster, with hardness 3.5, and specific gravity 6.200.

Before the blowpipe it gave reactions for vanadium, arsenic, lead, copper and zinc, and in the closed tube it fused readily, boiled up violently and gave off water.

A careful analysis gave

$\text{V}_2\text{O}_5$	$\text{As}_2\text{O}_5$	$\text{P}_2\text{O}_5$	$\text{PbO}$	$\text{CuO}$	$\text{ZnO}$	$\text{H}_2\text{O}$
18.95	3.82	0.18	54.93	6.74	12.24	2.70

It differs from descloizite in having part of the vanadic acid replaced by arsenic acid. The analyses, as well as all the physical properties of the mineral, show such a close resemblance to tritochorite that it is very possible that they are identical, and should both be considered as arsenical varieties of descloizite.

**GOLD IN NORTH CAROLINA.**—At a recent meeting of the Academy of Natural Sciences Professor H. Carvill Lewis exhibited some remarkable gold nuggets found in Montgomery county, N. C., forty miles east of Charlotte and two miles from Yadkin river. Some of the nuggets were of great size. One of them weighed over four pounds, and contained nearly \$1000 worth of gold. It was finer than any specimen in the collection at the U. S. Mint, and was probably one of the largest nuggets ever found in Eastern America. Many of the specimens exhibited were of nearly pure gold of a crystalline structure, and of a fine golden yellow color. It was stated that in the district of North Carolina, whence these nuggets were taken, gold is very abundant. The larger nuggets were found in the gulleys, where they had been washed out of the decomposed rock, and it had been stated that a shovelful of dirt dug out of the hillsides anywhere in the district would pan out traces of gold. Some years ago one man took out of a hole sixteen feet square \$30,000 worth of the precious metal. The quartzite containing the gold occurs in a white clay or decomposed schist.

#### BOTANY.<sup>1</sup>

**AN INTERESTING BOTANIC RELIC OF THE DISTRICT OF COLUMBIA.**<sup>2</sup>—At a meeting of the Biological Society of Washington, held October 19th, Mr. Lester F. Ward exhibited the original manuscript proceedings of the Washington Botanical Society, which had accidentally fallen into his hands. This society was formed in the year 1817 and continued in existence until 1826. It

<sup>1</sup> Edited by PROF. C. E. BESSEY, Ames, Iowa.

<sup>2</sup> Communicated by Mr. Lester F. Ward.